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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/845,391
Filing Date: April 30, 2001
Appellant(s): GANN ET AL.

Augustus W. Winfield
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 09/02/2005 appealing from the Office action mailed 06/02/2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5652664	Kusaka et al	7-1997
5025282	Nakamura et al	6-1991
6570615	Decker et al	5-2003

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,570,615 Decker et al in view of USPN 5,025,282 Nakamura et al.

As for Claim 1, Decker et al teaches on Column 4, Lines 41-67 and Column 5, Lines 1-17 and depicts in Figure 2 a photo-sensor assembly, comprising: a plurality of sets of lines of photo-sensors, each set comprising at least a first line and a second line, where photo-sensors in the first line and the second line have substantially the same pitch, and where photo-sensors in the first line are offset relative to photo-sensors in the second line by approximately one-half the pitch. Decker et al depicts six lines of pixels wherein the six lines of pixels comprise three groups of pixels each group having a first and second line of data that are offset from each other. However, Decker et al teaches that the six lines of photo-sensors comprise two lines of red, green, and blue photo-sensors and does not teach that the six lines of photo-sensors can all have different spectral bandwidths or colors.

Nakamura et al teaches on Column 7, Lines 8-17 and depicts in Figure 1 and 2 that when designing a color scanner that uses six lines of photo-sensors, that it is advantageous that the six photo-sensors have six different sensitivities corresponding to two red, two green, and two blue sensitivities. Nakamura et al teaches that it is advantageous to use two sets of RGB colors

having different peak color sensitivities in order to allow a scanner to distinguish between color photographic originals and color printed originals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the six lines of photo-sensors in the scanner of Decker et al to have six different spectral sensitivities as taught by Nakamura et al in order to allow a scanner to distinguish between color photographic originals and color printed originals.

In regards to Claim 2, Decker et al teaches 6 lines of photo-sensors, where N is at least six, each photo-sensor in one of the 6 lines receives a different spectral bandwidth of light than photo-sensors in the other 5 lines.

As for Claim 3, Decker et al teaches on Column 4, Lines 41-67 and Column 5, Lines 1-17 and depicts in Figure 2 a photo-sensor assembly, comprising: a plurality of sets of lines of photo-sensors, each set comprising at least a first line and a second line, where photo-sensors in the first line and the second line have substantially the same photo-sensor width. The examiner views that photo-sensors as depicted in Figure 2 indicate that the photo-sensors have substantially the same width. Decker et al teaches the photo-sensors in the first line are offset relative to photo-sensors in the second line by approximately one-half the photo-sensor width, However, Decker et al teaches that the six lines of photo-sensors comprise two lines of red, green, and blue photo-sensors and does not teach that the six lines of photo-sensors can all have different spectral bandwidths or colors.

Nakamura et al teaches on Column 7, Lines 8-17 and depicts in Figure 1 and 2 that when designing a color scanner that uses six lines of photo-sensors, that it is advantageous that the six photo-sensors have six different sensitivities corresponding to two red, two green, and two blue

sensitivities. Nakamura et al teaches that it is advantageous to use two sets of RGB colors having different peak color sensitivities in order to allow a scanner to distinguish between color photographic originals and color printed originals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the six lines of photo-sensors in the scanner of Decker et al to have six different spectral sensitivities as taught by Nakamura et al in order to allow a scanner to distinguish between color photographic originals and color printed originals.

In regards to Claim 4, Decker et al teaches 6 lines of photo-sensors, where N is at least six, each photo-sensor in one of the 6 lines receives a different spectral bandwidth of light than photo-sensors in the other 5-1 lines.

In regards to Claim 6, Decker et al teaches on Column 4, Lines 41-67 and Column 5, Lines 1-17 and depicts in Figure 2 A method of scanning, comprising: scanning an area with 6 lines of photo-sensors, where N is six, where each line of photo-sensor has a corresponding line of photo-sensor that is spatially offset by substantially one-half a pitch of the photo-sensors, Decker et al teaches obtaining bits of intensity data from each photo-sensor by use of an ADC (110); and combining the intensity data to obtain M times N bits of intensity data for the area. Decker et al teaches that each photo-sensor is input into an ADC that converts the analog signal into a digital bit representation. Decker et al does not specifically state the bit data format for the output of the ADC however, it is inherent that it produce and arbitrary M Bits of data. Furthermore, the data is combined in that the output is the bit representation of all the photo-sensors. Therefore, there are M bits times N lines of data. However, Decker et al teaches that the

six lines of photo-sensors comprise two lines of red, green, and blue photo-sensors and does not teach that the six lines of photo-sensors can all have different spectral bandwidths or colors.

Nakamura et al teaches on Column 7, Lines 8-17 and depicts in Figure 1 and 2 that when designing a color scanner that uses six lines of photo-sensors, that it is advantageous that the six photo-sensors have six different sensitivities corresponding to two red, two green, and two blue sensitivities. Nakamura et al teaches that it is advantageous to use two sets of RGB colors having different peak color sensitivities in order to allow a scanner to distinguish between color photographic originals and color printed originals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the six lines of photo-sensors in the scanner of Decker et al to have six different spectral sensitivities as taught by Nakamura et al in order to allow a scanner to distinguish between color photographic originals and color printed originals.

Claims 5, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,570,615 Decker et al in view of USPN 5,025,282 Nakamura et al in further view of USPN 5,652,664 Kusaka et al.

As for Claim 5, Decker et al teaches on Column 4, Lines 41-67 and Column 5, Lines 1-17 and depicts in Figure 2 a photo-sensor assembly, comprising: 3 first lines of photo-sensors having a first size; 3 second lines of photo-sensors having a second size; where, within each line of photo-sensors, essentially all photo-sensors receive the same spectral bandwidth of light; However, Decker et al teaches that the six lines of photo-sensors comprise two lines of red, green, and blue photo-sensors and does not teach that the six lines of photo-sensors can all have different spectral bandwidths or colors.

Nakamura et al teaches on Column 7, Lines 8-17 and depicts in Figure 1 and 2 that when designing a color scanner that uses six lines of photo-sensors, that it is advantageous that the six photo-sensors have six different sensitivities corresponding to two red, two green, and two blue sensitivities. Nakamura et al teaches that it is advantageous to use two sets of RGB colors having different peak color sensitivities in order to allow a scanner to distinguish between color photographic originals and color printed originals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the six lines of photo-sensors in the scanner of Decker et al to have six different spectral sensitivities as taught by Nakamura et al in order to allow a scanner to distinguish between color photographic originals and color printed originals.

Decker et al in view of Nakamura et al does not teach that the photo-sensors in the second rows are a different size that the photo-sensors in the first rows.

Kusaka et al teaches in Figure 4 and on Column 6, Lines 8-50 that it is advantageous when designing an image scanner to allow for two rows of photo-sensors wherein the first row has a different pixel size than the second row. Kusaka et al teaches that this is advantageous because the use of two sizes of pixels increases image quality by increasing the signal to noise ratio and better enables the imaging system to obtain a properly focused image in both low light and high brightness conditions.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow the second rows of the red, green, and blue photo-sensors of Decker et al in view of Nakamura et al to have a different pixel size than the pixels in the preceding row as taught by Kusaka et al in order to increase image quality and better enable the

imaging system to obtain a properly focused image in both low light and high brightness conditions.

In regards to Claim 8, Decker et al teaches on Column 4, Lines 41-67 and Column 5, Lines 1-17 and depicts in Figure 2 a photo-sensor assembly, comprising: 3 first lines of photo-sensors having a first size; 3 second lines of photo-sensors having a second size; where, within each line of photo-sensors, essentially all photo-sensors receive the same spectral bandwidth of light; Decker et al teaches obtaining bits of intensity data from each photo-sensor by use of an ADC (110); and combining the intensity data to obtain M times N bits of intensity data for the area. Decker et al teaches that each photo-sensor is input into an ADC that converts the analog signal into a digital bit representation. Decker et al does not specifically state the bit data format for the output of the ADC however, it is inherent that it produce and arbitrary M Bits of data. Furthermore, the data is combined in that the output is the bit representation of all the photo-sensors. Therefore, there are M bits times N lines of data. However, Decker et al teaches that the six lines of photo-sensors comprise two lines of red, green, and blue photo-sensors and does not teach that the six lines of photo-sensors can all have different spectral bandwidths or colors.

Nakamura et al teaches on Column 7, Lines 8-17 and depicts in Figure 1 and 2 that when designing a color scanner that uses six lines of photo-sensors, that it is advantageous that the six photo-sensors have six different sensitivities corresponding to two red, two green, and two blue sensitivities. Nakamura et al teaches that it is advantageous to use two sets of RGB colors having different peak color sensitivities in order to allow a scanner to distinguish between color photographic originals and color printed originals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the six lines of photo-sensors in the scanner of Decker et al to have six different spectral sensitivities as taught by Nakamura et al in order to allow a scanner to distinguish between color photographic originals and color printed originals.

Decker et al in view of Nakamura et al does not teach that the photo-sensors in the second rows are a different size that the photo-sensors in the first rows.

Kusaka et al teaches in Figure 4 and on Column 6, Lines 8-50 that it is advantageous when designing an image scanner to allow for two rows of photo-sensors wherein the first row has a different pixel size than the second row. Kusaka et al teaches that this is advantageous because the use of two sizes of pixels increases image quality by increasing the signal to noise ratio and better enables the imaging system to obtain a properly focused image in both low light and high brightness conditions.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow the second rows of the red, green, and blue photo-sensors of Decker et al in view of Nakamura et al to have a different pixel size than the pixels in the preceding row as taught by Kusaka et al in order to increase image quality and better enable the imaging system to obtain a properly focused image in both low light and high brightness conditions.

As for Claim 9, Official notice is taken that it was well known in the art at the time the invention was made to enable imaging systems to perform line thinning operations that reduce image data from an image sensor of a given number of lines by ½ in order to perform a line thinning technique.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to enable the image scanning system of Decker et al to perform line thinning operations that reduce image data from an image sensor of a given number of lines by ½ in order to perform a line thinning technique. As appellant has not traversed the old and well known statement set forth above, line thinning operations that reduce image data from an image sensor of a given number of lines by ½ is now taken as admitted prior art. See MPEP 2144.03(c).

(10) Response to Argument

Appellant's first argument states that the combination of Decker et al and Nakamura et al does not teach or suggest sets of staggered lines where the spectral bandwidth of light received by the first line is different than the spectral bandwidth of the second line. Appellant's further asserts that since both sets of lines in Decker et al receive the same spectral bandwidth, the combination of Decker and Nakamura suggests six staggered pairs of lines, with each pair of lines receiving the same spectral bandwidth.

The examiner strongly disagrees with the appellant's characterization. The examiner points out that Decker et al teaches and depicts in Figure 2 a linear pixel array used to capture an image (104). Decker et al further teaches that the linear pixel array is arranged to have six rows of colors. Decker et al further teaches the use of two red, two green and two blue rows of sensors offset from each other by approximately one-half pitch. However, Decker et al is silent as to the specifics of the spectral sensitivity for the color filters and further does not teach that the second rows of red, green and blue pixels can have a different spectral sensitivity than the first rows of red, green and blue pixels.

Nakamura et al also teaches the use of a color linear image sensor which utilizes six rows of pixels. Nakamura et al further teaches the use of two red, two green and two blue rows of sensors and further depicts in Figure 2 that it is advantageous to set the spectral sensitivity for the second rows of red, green and blue pixels different from the spectral sensitivity of the first rows of red, green and blue pixels. Nakamura et al further teaches on Column 7, Lines 8-17 that this method of providing six different spectral sensitivities is advantageous because it allows the linear image sensor to capture an image and distinguish between photographic originals and color prints.

Therefore, the examiner asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the six lines of photo-sensors in Decker et al to use six different spectral bandwidths as taught by Nakamura et al in order to allow the linear imaging system of Decker et al to distinguish between photographic originals and color prints.

As for appellant's second argument, appellant asserts that the examiners proposed modification would render the prior art invention unsatisfactory for its intended purpose. appellant further argues that in the present application, if the two lines of the staggered array receive different spectral bandwidths, then the assembly generates two separate images. appellant then asserts that Decker et al does not teach or suggest that two separate images would be satisfactory in full-resolution mode.

The examiner disagrees with appellant. Furthermore, in response to appellant argument that the references fail to show certain features of appellant invention, it is noted that the features upon which applicant relies (i.e., two separate images would be satisfactory in full-resolution mode) are not recited in the rejected claim(s). Although the claims are interpreted in light of the

specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Appellant argues that in the office action dated 06/02/2005, at page 8, the examiner cites Decker et al column 4, Lines 41-67 and Column 5, Lines 1-17 as teaching photo-sensors of two different sizes. Appellant states that the cited text does not support the assertion.

The examiner strongly disagrees with the appellant assertion. The examiner points out that in the office action dated 06/02/2005, at page 8 the examiner stated "Decker et al teaches on Column 4, Lines 41-67 and Column 5, Lines 1-17 and depicts in Figure 2 a photo-sensor assembly, comprising: 3 first lines of photo-sensors having a first size; 3 second lines of photo-sensors having <u>a second size</u>" **(<u>not a different size</u>).** Furthermore, the examiner points out that in Claim 5, Lines (2 and 3), appellant claims that first line has <u>a first size</u> and the second line has <u>a second size</u>. It is not until line (5) of the claim that appellant states that the <u>second size is different from the first size</u>. Therefore, the examiner relied upon Decker et al to teach that the first line has a first size and the second line has a second size. And then relied upon the teachings of Kusaka et al to teach that the first and second sizes can be different.

Appellant argues that Kusaka et al is concerned with auto-focus, not color and does not teach anything about spectral bandwidths of light. Furthermore, appellant argues that the combination of Decker et al., Nakamura et al., and Kuska et al. does not teach or suggest anything about how spectral bandwidth would be assigned to staggered arrays and does not teach anything about how spectral bandwidths would be assigned to photo-sensors of different sizes.

The examiner points out that although Kusaka et al is concerned with auto-focus and not color, the fact that appellant has recognized another advantage which would flow naturally from

following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Furthermore, Kusaka et al teaches on Column 6, Lines 8-50 that by synthesizing data from both a large pixel and a small pixel the signal to noise ratio of the pixel can be increased. This improves image quality by decreasing noise and allowing the imaging system to capture an image with a wide range from dark to bright. Therefore, the examiner believes that one of ordinary skill in the art would have been motivated to combine the teachings of Kusaka et al which teaches synthesizing image data from pixels of different sizes to improve S/N in the image with the teachings of Decker et al. in view of Nakamura et al to enable a linear imaging system which can distinguish between photographic originals and copied prints in order to have an improved signal to noise ratio by adjusting the size of one of the rows of pixels to a smaller size as taught by Kusaka et al.

Appellant argues that no argument has been presented for combining information from two different sizes of photo sensors during one scan.

The examiner disagrees with appellant and points out that Kusaka et al teaches on Column 6, Lines 8-50 that the image data from both the large pixel and the small pixel are synthesized together at the output. Therefore, Kusaka et al teaches combining information from two different sizes of photo sensors during one scan.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

James M. Hannett
Examiner
Art Unit 2612

JMH
January 6, 2006

Conferees: SPE AU 2612

Ngoc Yen Vu

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